CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

An ISO 9001:2008 Certified Company

NABL - Accredited Laboratory as per ISO / IEC-17025 : 2005

JAS-ANZ BSCIC ISO 9001 REGISTERED

Job No.: CTCE/BBMP/W.No.04/KRIDL/WMM/Gradation/2015-16

08.10.2015

GRADATION FOR WMM
MORTH TABLE-400-11

Customer : **Asst. Executive Engineer,** Yelahanka New Town Sub Division, BBMP, Bangalore.

Agency : **Technical Manager (West),** KRIDL, Bangalore.

Name of Work : Improvements to drain and asphalting to Someshwara temple 3rd B main cross roads in Ward No.04, BBMP, Bangalore.

Reference : BBMP/AEE/YNSD/W.O/ /2015-16 Dated: 05.10.2015

Date of Testing : 08.10.2015

Material : WMM

Sample Location : WMM Mix Plant

Oven Dry Wt (gm): **7895**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	190	190	2.4	97.6	95-100
22.4	2730	2920	37.0	63.0	60-80
11.2	1355	4275	54.1	45.9	40-60
4.75	995	5270	66.8	33.2	25-40
2.36	1140	6410	81.2	18.8	15-30
0.600	685	7095	89.9	10.1	8-22
0.075	510	7605	96.3	3.7	0-8

Note:

1. The report shall not be reproduced, except in full, without the written approval of the laborator
2. The results indicated above are based on the tests carried out on the samples received in the labo
3. Any Query regarding the report must be reported within 30 days from the date of testing

Civil-Tech Consultants & Engineers Bangalore

AEW-4

****

M/s. Civil-Tech Consultants & Engineers

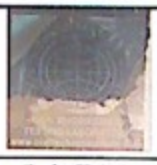
23/14, 7th Cross, 3rd Stage,
4th Block, Shakthiganapathinagara,
Basaveshwaranagar,
Bangalore-560079.

CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory
An ISO 9001:2008 Certified Company
NABL - Accredited Laboratory as per ISO / IEC-17025 : 2005

JAS-ANZ BSCIC ISO 9001 REGISTERED

Job No : CTCE/BBMP/W No.04/KRIDL/WMM/AIV/2015-16 08.10.2015



Aggregate Impact Value
IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Yelahanka New Town Sub Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of the Work	Improvements to drain and asphalting to Someshwara temple 3rd B main cross roads in Ward No.04, BBMP, Bangalore.
Reference	BBMP/AEE/YNSD/W.O/ /2015-16 Dated: 05.10.2015
Source / Location	WMM Plant
Type of Mix	Wet Mix macadam
Date of Testing	08.10.2015

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	378	379	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	78	79	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	300	300	
4	Aggregate Impact value = percent fines	20.63	20.84	
	$100^{*} (W_2/W_1)$%			20.74

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

Civil-Tech Consultants & Engineers Bangalore

Note:

→ This test report should not be reproduced except in full, without written approval of the laboratory
→ The results indicated above are based on the tests carried out on the samples received in the laboratory
→ Any Query regarding the report must be reported within 30 days from the date of testing.

AE 2.4

****

M/s. Civil-Tech Consultants & Engineers
23/14, 7th Cross, 3rd Stage,
4th Block, Shakthiganapathinagara,
Basaveshwaranagar,
Bangalore-560079.

CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

An ISO 9001:2008 Certified Company

NABL - Accredited Laboratory as per ISO / IEC-17025 : 2005

JAS-ANZ BSCIC ISO 9001 REGISTERED

Job No.: CTCE/BBMP/W.No.04/KRIDL/WMM/S-1/2015-16 08.10.2015

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	**Asst. Executive Engineer,** Yelahanka New Town Sub Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of Work	Improvements to drain and asphalting to Someshwara temple 3rd B main cross roads in Ward No.04, BBMP, Bangalore.
Reference	BBMP/AEE/YNSD/W.O/ /2015-16 Dated: 05.10.2015
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	08.10.2015

Civil-Tech Consultants & Engineers Bangalore

Result : Flakiness Index = **12.35%**

Elongation Index = **13.52%**

Result : Combined Flakiness & Elongation index 25.87%

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

Note:

→ This test report should not be reproduced except in full, without written approval of the laboratory

→ The results indicated above are based on the tests carried out on the samples received in the laboratory

→ Any Query regarding the report must be reported within 30 days from the date of testing.

AE W-4

M/s. Civil-Tech Consultants & Engineers
23/14, 7th Cross, 3rd Stage,
4th Block, Shakthiganapathinagara,
Basaveshwaranagar,
Bangalore-560079.

CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

NABL - Accredited Laboratory as per ISO / IEC-17025 :2005

T-2377

Job No : CTCE/BBMP/W.No.04/KRIDL/CSR-10/975h/QB/2015-16 19.10.2015

TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

*CUSTOMER	:	**Asst. Executive Engineer,** Yelahanka New Town Sub Division, BBMP, Bangalore.
*AGENCY	:	**Technical Manager (West),** KRIDL, Bangalore.
*NAME OF THE WORK	:	Improvements to drain and asphalting to Someshwara temple 3rd B main cross roads in Ward No.04, BBMP, Bangalore.
REFERENCE	:	BBMP/AEE/YNSD/W.O/ /2015-16 Dated: 05.10.2015
*SAMPLE ID	:	Bitumen
DATE OF SAMPLING	:	17.10.2015
DATE OF TESTING	:	19.10.2015

The results of the tests conducted on the bitumen sample.

Sl. No	Description	Test Method as per IS	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 °C, 1/10 mm	IS :1203 -1978 (RA-2009)	84	80 to 100
2	Softening point, °C	IS :1205 -1978 (RA-2009)	44	Min. 40
3	Ductility at 27 °C, cm	IS :1208 -1978 (RA-2009)	100 >	Min. 75
4	Flash Point, °C	IS :1209 -1978 (RA-2009)	294	Min. 220

*Information is furnished by the Customer/Representative.

Civil-Tech Consultants & Engineers Bangalore

Note:

⇒ This test report shall not be reproduced except in full, without written approval of the laboratory.

⇒ The results indicated above are based on the tests carried out on the samples received in the laboratory.

⇒ Any Query regarding the report must be reported within 30 days from the date of testing.

AE W.4

VISHWANATH. I.A.
Chief Executive Officer

#23/14, 7th Cross, 3rd Stage, 4th Block, Shakthi Ganapathi Nagara, Basaveshwaranagar, Bangalore-79.
Tele Fax : 23223227, Website : www.civiltechconsultants.com
E-mail : vishwanath.ia@civiltechconsultants.com / info@civiltechconsultants.com

CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

An ISO 9001:2008 Certified Company

NABL - Accredited Laboratory as per ISO / IEC-17025 : 2005

JAS-ANZ BSCIC ISO 9001 REGISTERED

Job No.: CTCE/BBMP/W.No.04/KRIDL/BM/Bitumen/2015-16 20.10.2015

BITUMEN CONTENT DETERMINATION OF BITUMINOUS MACADAM MIX

As per IS2386 and IRC:SP:11-1984

CUSTOMER	**Asst. Executive Engineer,** Yelahanka New Town Sub Division, BBMP, Bangalore.
AGENCY	**Technical Manager (West),** KRIDL, Bangalore.
NAME OF THE WORK	Improvements to drain and asphalting to Someshwara temple 3rd B main cross roads in Ward No.04, BBMP, Bangalore.
REFERENCE	BBMP/AEE/YNSD/W.O/ /2015-16 Dated: 05.10.2015
SAMPLE I/D	Someshwara temple road Ward No.04, BBMP, Bangalore
DATE OF TESTING	20.10.2015

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	483	482
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g (corrected)	17	18.00
7. Bitumen content in %	3.40	3.60
8. Average	3.50	

Civil-Tech Consultants & Engineers Bangalore

Note:

- This test report should not be reproduced except in full, without written approval of the laboratory
- The results indicated above are based on the tests carried out on the samples received in the laboratory
- Any Query regarding the report must be reported within 30 days from date of testing.

AE W-4

M/s. Civil-Tech Consultants & Engineers
23/14, 7th Cross, 3rd Stage,
4th Block, Shakthiganapathinagara,
Basaveshwaranagar,
Bangalore-560079.

CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

An ISO 9001:2008 Certified Company

NABL - Accredited Laboratory as per ISO / IEC-17025 : 2005

Job No.: CTCE/BBMP/W.No 04/KRIDL/BM/Bitumen/2015-16 20.10.2015

GRADATION DETERMINATION OF BITUMINOUS MACADAM MIX

As per IS2386 and IRC:SP:11-1984

CUSTOMER	**Asst. Executive Engineer,** Yelahanka New Town Sub Division, BBMP, Bangalore.
AGENCY	**Technical Manager (West),** KRIDL, Bangalore.
NAME OF THE WORK	Improvements to drain and asphalting to Someshwara temple 3rd B main cross roads in Ward No.04, BBMP, Bangalore.
REFERENCE	BBMP/AEE/YNSD/W.O/ /2015-16 Dated: 05.10.2015
SAMPLE I/D	Someshwara temple road Ward No.04, BBMP, Bangalore.
DATE OF TESTING	20.10.2015

GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-04 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
26.5	0	0	0	100	100
19	32.36	6.70	6.70	93.30	90-100
13.2	88.69	18.36	25.06	74.94	56-88
4.75	258.4	53.50	78.56	21.44	16-36
2.36	46.35	9.60	88.16	11.84	4-19
0.3	25.32	5.24	93.40	6.60	2-10
0.075	9.12	1.89	95.29	4.71	0-8

Þ The results indicated above are based on the tests carried	Trail 2				Specified Limits as per MORTH specification table 500-04 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
26.5	0	0	0	100	100
19	33.12	6.87	6.87	93.13	90-100
13.2	82.32	17.08	23.95	76.05	56-88
4.75	259.3	53.80	77.75	22.25	16-36
2.36	45.36	9.41	87.16	12.84	4-19
0.3	25.36	5.26	92.42	7.58	2-10
0.075	13.26	2.75	95.17	4.83	0-8

Note:

Þ This test report should not be reproduced except in full, without written approval of the laborat

Þ The results indicated above are based on the tests carried out on the samples received in the la

Þ Any Query regarding the report must be reported within 30 days from the date of testing.

M/s. Civil-Tech Consultants & Engineers

23/14, 7th Cross, 3rd Stage,
4th Block, Shakthiganapathinagara,
Basaveshwaranagar,
Bangalore-560079.

CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

An ISO 9001:2008 Certified Company

NABL - Accredited Laboratory as per ISO / IEC-17025 : 2005

BSCIC ISO 9001 REGISTERED JAS-ANZ

Job No.: CTCE/BBMP/W.No.04/KRIDL/SDBC/Bit/2015-16 21.10.2015

BITUMEN CONTENT DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

AS per IRC:SP:-1984

CUSTOMER	**Asst. Executive Engineer,** Yelahanka New Town Sub Division, BBMP, Bangalore.
AGENCY	**Technical Manager (West),** KRIDL, Bangalore.
NAME OF THE WORK	Improvements to drain and asphalting to Someshwara temple 3rd B main cross roads in Ward No.04, BBMP, Bangalore.
REFERENCE	BBMP/AEE/YNSD/W.O/ /2015-16 Dated 05.10.2015
SAMPLE I/D	Someshwara temple road Ward No.04, BBMP, Bangalore.
DATE OF TESTING	21.10.2015

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1 Weight of Mixture before Test, g	500	500
2 Weight of Mixture after Test, g	475 5	474 5
3 Weight of Asphalt and Mineral matter Extracted, g	-	-
4 Weight of Mineral Matter, g	-	-
5 Weight of Ash, g		
6 Weight of Bitumen Extracted, g (corrected)	24 5	25 50
7 Bitumen content in %	4 90	5 10
8 Average	5.00	

Civil-Tech Consultants & Engineers Bangalore

Note:

- This test report should not be reproduced except in full, without written approval of the laboratory
- The results indicated above are based on the tests carried out on the samples received in the laboratory
- Any Query regarding the report must be reported within 30 days from the date of testing.

AE W-4

M/s. Civil-Tech Consultants & Engineers
23/14, 7th Cross, 3rd Stage,
4th Block, Shakthiganapathinagara,
Basaveshwaranagar,
Bangalore-560079.

CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

An ISO 9001:2008 Certified Company

NABL - Accredited Laboratory as per ISO / IEC-17025 : 2005

JAS-ANZ BSCIC ISO 9001 REGISTERED

Job No.: CTCE/BBMP/W.No.04/KRIDL/SDBC/Bit/2015-16 21.10.2015

BITUMEN CONTENT GRADATION DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

As per IS2386 and IRC:SP:11-1984

CUSTOMER	**Asst. Executive Engineer,** Yelahanka New Town Sub Division, BBMP, Bangalore.
AGENCY	**Technical Manager (West),** KRIDL, Bangalore.
NAME OF THE WORK	Improvements to drain and asphalting to Someshwara temple 3rd B main cross roads in Ward No.04, BBMP, Bangalore.
REFERENCE	BBMP/AEE/YNSD/W.O/ /2015-16 Dated: 05.10.2015
SAMPLE I/D	Someshwara temple road Ward No.04, BBMP, Bangalore.
DATE OF TESTING	21.10.2015

GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	25.36	5.33	5.33	94.67	90-100
4.75	262.2	55.14	60.48	39.52	35-51
2.36	53.26	11.20	71.68	28.32	24-39
1.18	40.22	8.46	80.13	19.87	15-30
0.3	25.35	5.33	85.47	14.53	9-19
0.075	31.22	6.57	92.03	7.97	3-8

Sieve Size in mm	Trail 2				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	36.32	7.65	7.65	92.35	90-100
4.75	260.5	54.90	62.55	37.45	35-51
2.36	35.21	7.42	69.97	30.03	24-39
1.18	38.52	8.12	78.09	21.91	15-30
0.3	36.25	7.64	85.73	14.27	9-19
0.075	36.32	7.65	93.39	6.61	3-8

Note:

- This test report should not be reproduced except in full, without written approval of the laboratory.
- The results indicated above are based on the tests carried out on the samples received in the laboratory.
- Any Query regarding the report must be reported within 30 days from the date of testing.

Civil-Tech Consultants & Engineers Bangalore

AE W-4

M/s. Civil-Tech Consultants & Engineers
23/14, 7th Cross, 3rd Stage,
4th Block, Shakthiganapathinagara,
Basaveshwaranagar,
Bangalore-560079.